

Missouri Department of Natural Resources

Total Maximum Daily Load Information Sheet

Indian Creek (and Tributary) and Courtois Creek

Waterbody Segment at a Glance:

County: Washington
Nearby Cities: Courtois, Viburnum
Length of impairment: 1.5 miles
Pollutants: Zinc
Source: Drainage from Viburnum Division
Lead Mine Tailings Ponds



State map showing location of watershed

Note: The current assessment of impairment based on additional monitoring since the development of the 2002 303(d) list is: Indian Creek 1.5 miles, Tributary to Indian Creek 0.5 miles and Courtois Creek downstream of Indian Creek 3.0 miles.

TMDL Priority Ranking: High

Description of the Problem

Beneficial uses of Indian Creek and Tributary to Indian Creek

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption

Beneficial uses of Courtois Creek

- Livestock and Wildlife Watering
- Protection of Cool Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Whole Body Contact Recreation
- Boating

Use that is impaired

- Protection of Warm Water Aquatic Life (Indian Creek and Tributary)
- Protection of Cool Water Aquatic Life (Courtois Creek)

Standards that apply

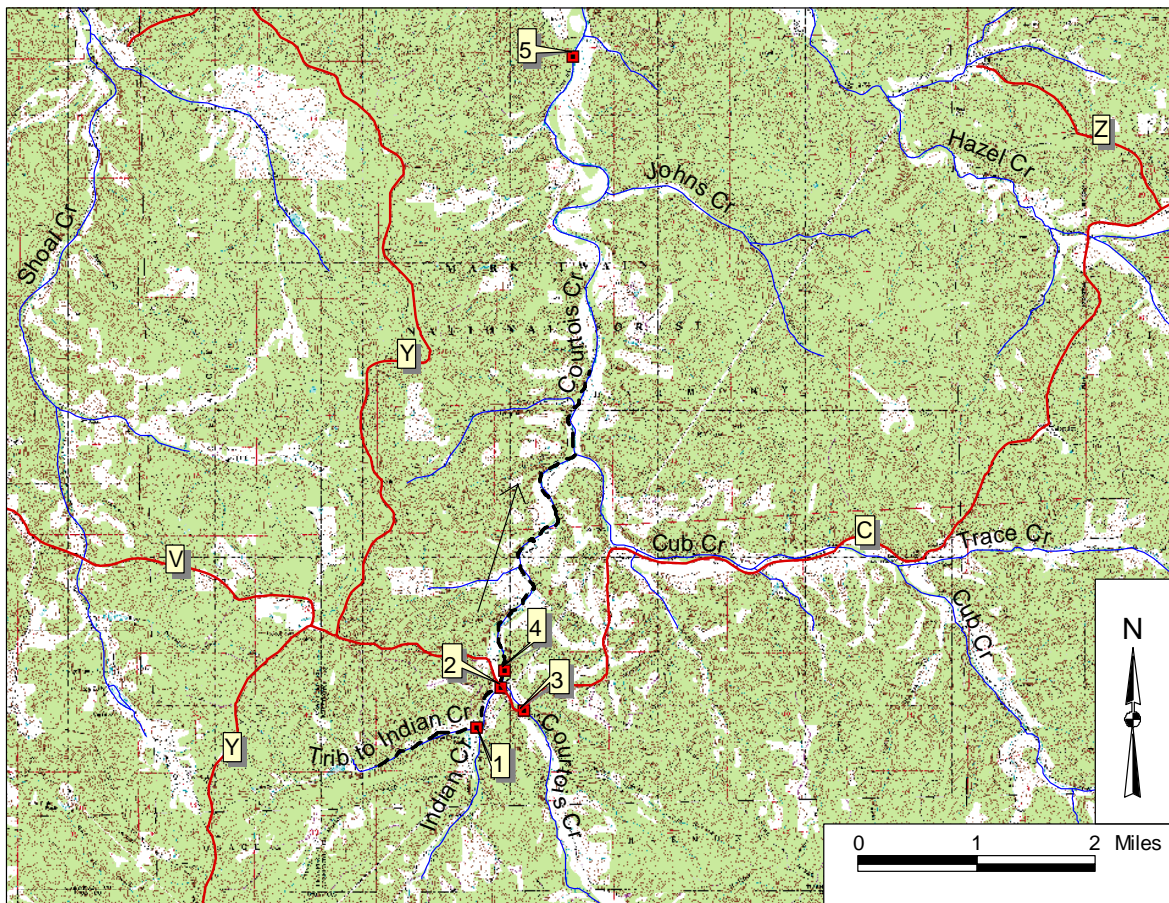
- The Missouri Water Quality Standard (WQS), found in 10 CSR 20-7.031 Table A, for dissolved zinc is 306 µg/L for Indian Creek and Tributary (water hardness is >200 mg/L) and 236 µg/L for Courtois Creek (water hardness range of 125-200).

- The general criteria of the Water Quality Standards, found in 10 CSR 20-7.031 (3)(D), states: “Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life”.

Water Quality Data

Water quality studies of Indian and Courtois Creek have occurred between 2001 and 2003. Data was collected at the sites shown on the map below. A summary of the chemical data is presented in Table 1. A summary of the aquatic invertebrate data is presented in Table 2.

Impaired Segments of Indian and Courtois Creeks in Washington County, Missouri, with Sampling Sites



--- Impaired Segment → Direction of flow

Sample Site Index

- 1 – Tributary to Indian Creek
- 2 – Indian Creek downstream from tributary
- 3 – Courtois Creek upstream from Indian Creek (control)
- 4 – Courtois Creek just downstream from Indian Creek
- 5 – Courtois Creek 6 miles downstream from Indian Creek

Table 1. Summary of Water Quality Studies Indian and Courtois Creeks below the Viburnum Division Mine and Tailings Ponds, 2001-2003.

| Site # | Flow (cfs) | Hardness (mg/L) | Mean Concentration of Dissolved Metal in µg/L | | | | | |
|--------|------------|-----------------|---|----|-----|-----|------|-----|
| | | | Fe* | Cd | Cu | Pb | Ni | Zn |
| 1 | 1.9 | 230 | 5.3 | <1 | <10 | 9.1 | 15.6 | 129 |
| 2 | 9.2 | 260 | 7.1 | <1 | <10 | 1.6 | 3.8 | 169 |
| 3 | 9.7 | 160 | 11.6 | <1 | <10 | <2 | 2.7 | 48 |

*Fe is the symbol for Iron;Cd=Cadmium;Cu=Copper;Pb=Lead;Ni=Nickel;Zn=Zinc

Table 2. Aquatic Invertebrate Community Biocriteria Scores for Indian and Courtois Creeks, 2001-2002.

| Site # | Year | Season | Biocriteria Score |
|---------------|------|--------|-------------------|
| 2 | 2001 | Spring | 12 |
| 2 | 2001 | Fall | 12 |
| 2 | 2002 | Spring | 12 |
| 3 | 2001 | Spring | 16 |
| 4 | 2001 | Fall | 14 |
| 4 (duplicate) | 2001 | Fall | 14 |
| 4 | 2002 | Spring | 14 |
| 5 | 2001 | Fall | 16 |
| 5 (duplicate) | 2001 | Fall | 16 |
| 5 | 2002 | Spring | 16 |

Note: Biocriteria scores of 16 or greater indicate a normal aquatic invertebrate community. Scores of 14 or less indicate impairment of the aquatic invertebrate community.

For more information call or write:

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